

PATENT SPECIFICATION (11)

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(54) FURNITURE SUPPORTING STRUCTURE

(71) We, DULA-WERKE DUSTMANN & Co., a company organised under the laws of the Federal Republic of Germany, (a Kommanditgesellschaft, the present sole personally responsible partner of which is HEINRICH DUSTMANN), of 46 Dortmund Hombruch, Harkortstrasse 25, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to furniture support apparatus for forming the supporting structure of box-like furniture, such as consoles, counters, or tables with drawers, the apparatus comprising a profiled column having undercut grooves and a number of insertion elements which can be fitted into the grooves.

It is known to insert clamp elements into the undercut grooves in columns of the kind referred to and to brace them by spreading apart two clamp ends towards adjacent webs of a profiled column, and then to connect on to these clamp elements further parts, especially cross members, for building box-shaped or other furniture. In the known apparatus the undercut grooves remain open along the zones not occupied by the clamp elements, which results in an unsightly appearance. Furthermore, using the known clamp element produces a further disadvantage that two adjacent longitudinal webs of the profiled column are forced apart by the clamp elements, whereby adjacent undercut grooves can be damaged so that they cannot any longer be used so satisfactorily for insertion of other parts.

Furthermore, it is known to fasten tongues, preferably by welding, to continuous columns without profiling or undercut grooves, for fitting cross members in the usual way. This conventional production method is, however, very expensive, and the use of welded joints always calls for subsequent surface-treatment.

It is also already known to combine closed sections of column having threaded

ends with profiled sections of column, likewise provided with threaded ends for screwing to the closed sections. These profiled sections are provided for connection of suitable cross members. Production of these parts with threaded ends is, however, likewise very expensive, and cross-connection of any kind of parts is limited to the parts of the column which comprise profiled sections. Due to the sub-division of the column into profiled and unprofiled portions, the rigidity of the column is impaired. Furthermore, the external appearance of the column is spoilt by the transverse joints occurring where the closed column sections are screwed together with the profiled column sections.

An object of the present invention is to provide apparatus which, by means of a few standardised parts, allows in a particularly simple way the assembly of many kinds of box-like furniture, which furniture has an aesthetically pleasing appearance, especially in respect of the columns and the transverse parts connected to the columns, and the rigidity of which, particularly of the columns, is not impaired.

According to the invention, furniture support apparatus comprises a column having at least one longitudinal groove therein; an interlocking formation such as a dovetail web within the or each groove; a plurality of insertion elements to be slid longitudinally into said groove or grooves to interlock with the corresponding interlocking formation(s) and completely to fill the or each said groove, at least one insertion element being a connecting member for connecting another structural member to the column; and end caps to cover the groove at the two ends of the column, respectively, and to retain the insertion elements therein.

Because of this form of construction, it is possible to employ continuous columns which are therefore of greater strength, and to fill the individual undercut grooves completely with various kinds of insertion elements in such a way that there are suitable connecting elements at the required points,

and the remaining portions of the undercut-grooves are filled with respective insertion elements such that an overall visually or aesthetically very attractive appearance results.

It is particularly advantageous to provide the webs of each profiled column between the undercut grooves with outer faces which form parts of a cylindrical surface, the outer faces of the insertion elements between the webs then completing the cylindrical surface.

It is also advantageous if each profiled column has a web of dovetail shape constituting the interlocking formation between every two webs having cylindrical outer faces, the dovetail web lying behind the cylindrical surface. These dovetail-shaped webs are then specially suitable for sliding on correspondingly-shaped insertion elements, because each element then grips the corresponding dovetail-shaped web between and behind two webs having cylindrical outer faces.

An embodiment which can be employed in a particularly versatile way is obtained if each profiled column has four webs having cylindrical outer faces, arranged at equal angular pitch, so that on to the dovetail-shaped webs lying between them insertion elements can be fitted at right angles to one another.

For connecting sheet-like parts such as wooden panels or glass plates to the columns, insertion elements having outwardly-pointing projections can be inserted between the webs having cylindrical outer faces, so that the sheet-like parts can be fastened on to, or between, the projections.

For connecting more heavily loaded cross members to the columns, clamp elements of the kind already mentioned above as basically known can be employed. Each clamp element can be urged against a respective dovetail-shaped web to grip the web from both sides. As compared with the known use of clamp elements the advantage is gained that, when the clamp is used in the latter manner with the apparatus of the present invention, no bulging out of the undercut grooves in the column occurs.

An advantageous design results if two generally parallel parts of the clamp element are tightened at one end by a clamp screw against opposite sides of the dovetail-shaped web and the other ends of the two parts are urged outwards, by means of a spreader-screw, against the inner surfaces of a cross member enveloping the clamp element.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an exploded perspective view of apparatus in accordance with the inven-

tion for forming one corner of the structure of an item of furniture.

Figure 2 is a transverse section through the assembled structure of Figure 1.

Figure 3 is a perspective view of a cupboard-like piece of furniture including supporting structures formed in accordance with the invention.

Figure 4 is an exploded view showing the details of one corner of the piece of furniture of Figure 3.

Figure 5 is a transverse section through a profiled column with a clamp element fastened to it and to a cross-member, and

Figure 6 is a side elevation of the arrangement of Figure 5.

Referring to Figures 1 and 2, a profiled column 1, which is preferably made of aluminium, is provided with four outwardly-pointing webs 2 which are arranged at equal angular pitch, i.e. they contain an angle of 90° between each pair. The outer faces 3 of these webs form parts of a cylindrical surface. Between every two webs 2 is an undercut groove in the centre of which a dovetail-shaped web 4 is formed, the outer surface of which stands back from the cylindrical surface 3.

In the embodiment illustrated, insertion elements 5 have dovetail channels which interlock with two of the webs 4 by sliding the elements longitudinally into the undercut groove containing the respective web. The elements 5 have part cylindrical outer faces 6, so that the outer faces 3 of the webs 2 100 and the outer faces 6 of the adjacent insertion elements 5 together form, in effect, a continuous cylindrical surface.

The other undercut grooves contain similarly inserted and interlocked elements which have exteriors of other forms. For example as shown in Fig. 2 an insertion element 7 has a web 8 projecting outwards for fastening a wooden panel 9 to the column 1. A further insertion element 10 has two parallel webs 11 projecting outwards for receiving a glass plate 12 therebetween. A further insertion element 13 is shown in the form of a cross member in Fig. 1.

Together, the various insertion elements completely fill the undercut grooves.

As Fig. 1 further shows, at each end of the profiled column 1 an end cap 14 is provided. Each end cap can be driven into a longitudinal cylindrical bore extending through the inside of the column. Alternatively, a threaded member may be inserted into the bore so that the end can be screwed to the column. A threaded foot 15 for adjustment of the height of the corner of the item of furniture can be screwed into the bottom end cap 14.

As Figs. 3 and 4 show, because of the design described basically with reference to Figs. 1 and 2, any required piece of furni-

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ture, for example the console-like piece of furniture shown in Fig. 3, can be assembled without the need for any special construction processes such as welding or screwing. The individual insertion elements are slid in turn into the undercut grooves in the columns, and the portions of the undercut grooves which are not needed for structural connection purposes are filled by filter elements with cylindrical outer faces 6, so that the visible parts of the column as a whole present a smooth cylindrical appearance, as shown particularly in Fig. 4. After inserting all of the insertion elements, it is merely necessary to fit the end caps 14 on the two ends of each column 1, the filler elements ensuring that the structural elements are restrained from sliding along the grooves.

Figs. 5 and 6 show how a cross member, or other member, for carrying particularly heavy loads can be fastened to the column. A clamp element 16 comprises two parts of spring steel which are generally parallel with one another, the two parts cooperating with one another through a tension screw 17 near one end and a spreader-screw 18 near to their other end. The ends associated with the tension-screw 17 are bent inwards in a hook-shape so that upon tightening the screw 17 these ends seat closely on opposite sides of the corresponding dovetail-shaped web 4, whilst the other ends of the two parts of the clamp are bent outwards in order to brace themselves firmly against the inside surfaces of a cross member 19 when spread apart by means of the spreader-screw 18. The cross member 19 can be slid over the clamp element 16, and for this purpose may have a cut-away wall portion at its base.

The embodiments described can clearly be altered in many respects without departing from the basic idea of the invention. Thus, for example, the profiling of the column, and correspondingly the shape of the insertion elements, could be formed quite differently. The number of connection webs could also be increased or reduced, and also the outer faces of the webs between the undercut grooves and/or of the insertion elements could be shaped otherwise, for example flat so that a polygonal outer periphery of the column results, with all of the undercut grooves filled by structural or filler insertion elements.

WHAT WE CLAIM IS:—

1. Furniture support apparatus comprising a column having at least one longitudinal groove therein; an interlocking formation such as a dovetail web within the or each

groove; a plurality of insertion elements to be slid longitudinally into said groove or grooves to interlock with the corresponding interlocking formation(s) and completely to fill the or each said groove, at least one insertion element being a connecting member for connecting another structural member to the column; and end caps to cover the groove at the two ends of the column, respectively, and to retain the insertion elements therein.

2. Apparatus as claimed in Claim 1, in which the column has adjacent the or each groove, webs having outer faces which form parts of a cylindrical surface; and in which at least one insertion element has an outer face which when the element is inserted between the webs continues the cylindrical surface.

3. Apparatus as claimed in Claim 2, in which the column has a web of dovetail shape constituting said interlocking formation between every two webs having cylindrical outer faces, the outer face of the dovetail web lying behind the cylindrical surface.

4. Apparatus as claimed in Claim 2 or Claim 3, in which the column has four of said webs having cylindrical outer faces which webs are arranged at equal angular pitch.

5. Apparatus as claimed in Claim 3, including a clamp element for connecting a cross member to the column, which clamp element grips opposite sides of the dovetail web.

6. Apparatus as claimed in Claim 5, in which the clamp element comprises two generally parallel parts; a clamp screw adjacent one end of the parts for clamping that end of each part against a respective side of the dovetail-shaped web; and a spreader-screw for urging the other end of the two parts against the inside of the cross member which envelops the clamp element.

7. Apparatus as claimed in any preceding claim, including an insertion element having at least one outwardly-pointing projection for attaching a sheet-like part, such as a wooden panel or a glass plate, to the column.

8. Apparatus as claimed in Claim 1 and substantially as hereinbefore described with reference to Figs. 1 and 2, or Figs. 3 and 4 and/or Figs. 5 and 6 of the accompanying drawings.

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1494407 COMPLETE SPECIFICATION

5 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale*
Sheet 1

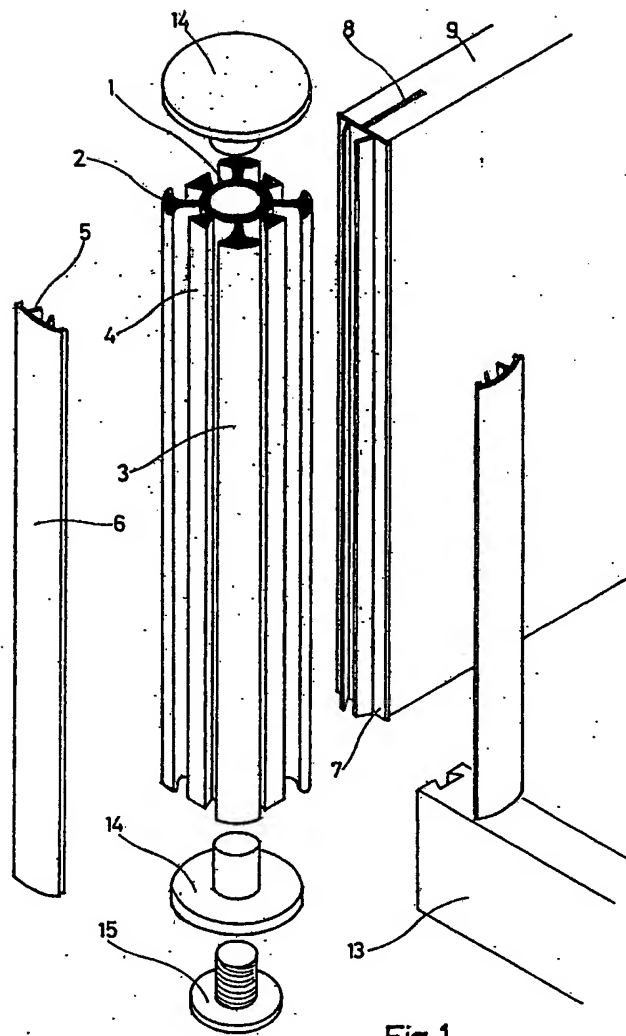


Fig. 1

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COMPLETE SPECIFICATION

5 SHEETS

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Sheet 2

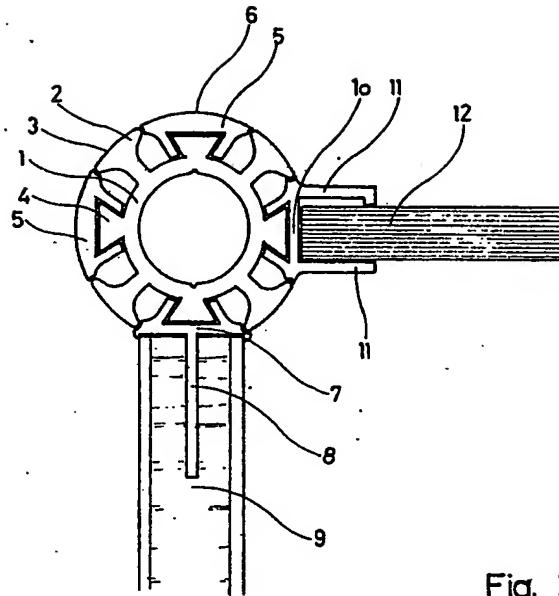


Fig. 2

1494407 COMPLETE SPECIFICATION

5 SHEETS *This drawing is a reproduction of
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Sheet 3

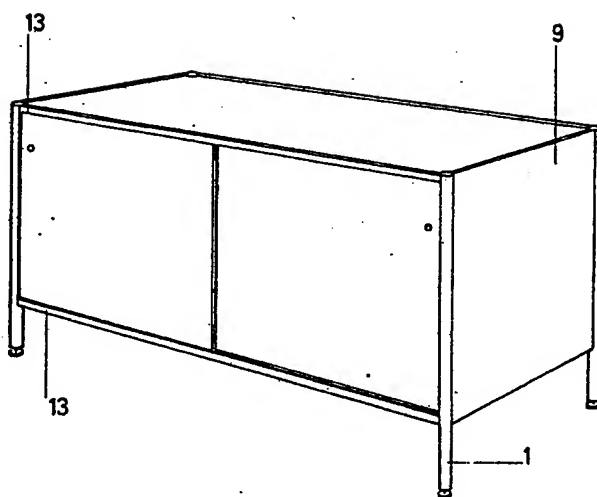


Fig. 3

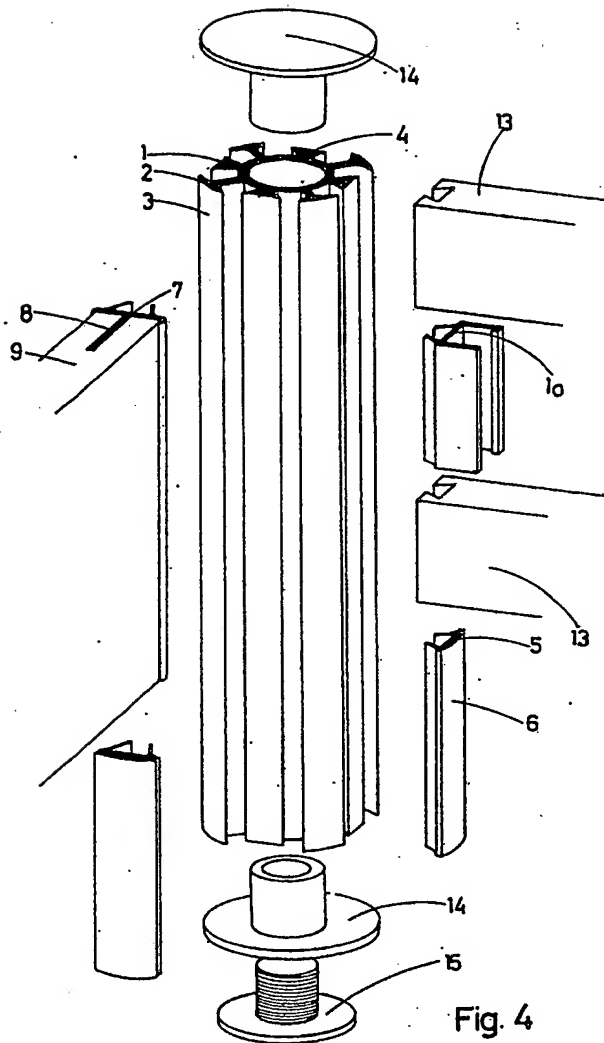


Fig. 4

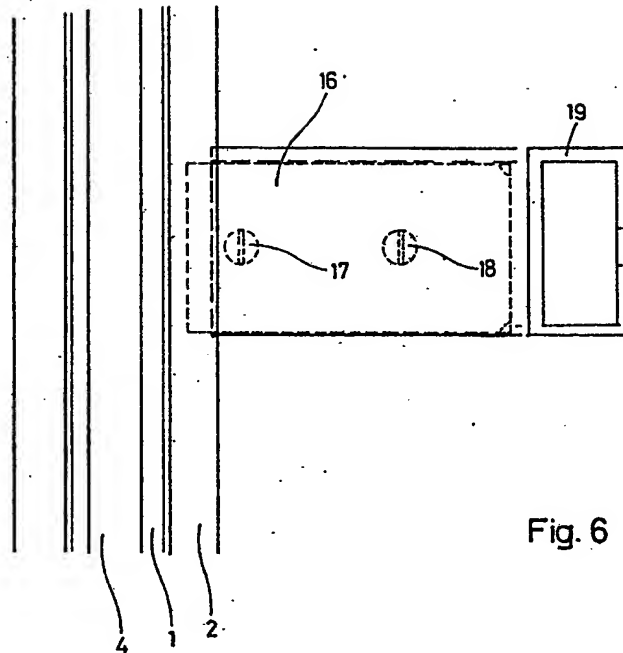


Fig. 6

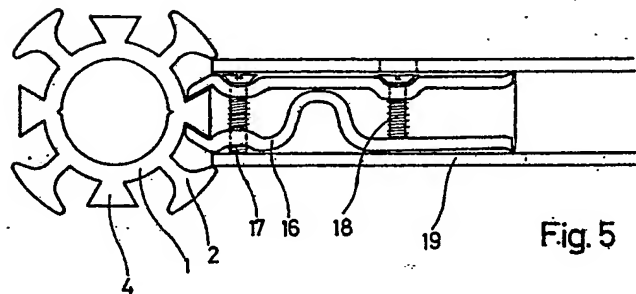


Fig. 5